Next Generation Science Standards Science

Grade K

Adopted 2013

Motion and Stability: Forces and Interactions K-PS2

Students who demonstrate understanding can:

K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. K-PS2-1

K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. K-PS2-2

Energy K-PS3

Students who demonstrate understanding can:

K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface. K-PS3-1

K-PS3-2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. K-PS3-2

From Molecules to Organisms: Structures and Processes K-LS1

Students who demonstrate understanding can:

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. K-LS1-1

Earth's Systems K-ESS2

Students who demonstrate understanding can:

K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. K-ESS2-1

K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. K-ESS2-2

Earth and Human Activity K-ESS3

Students who demonstrate understanding can:

K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. K-ESS3-1

K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. K-ESS3-2

K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. K-ESS3-3

Engineering Design K-2-ETS1

Students who demonstrate understanding can:

K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. K-2-ETS1-1

K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. K-2-ETS1-2

K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. K-2-ETS1-3

Science and Engineering Practices SEP

1. Analyzing and Interpreting Data SEP.1

K-2. Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. SEP.1.K-2

- Analyze data from tests of an object or tool to determine if it works as intended. SEP.1.K-2.1
- Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. SEP.1.K-2.2

2. Asking Questions and Defining Problems SEP.2

K-2. Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested. SEP.2.K-2

- Ask questions based on observations to find more information about the designed world. SEP.2.K-2.1
- Ask questions based on observations to find more information about the natural and/or designed world(s). SEP.2.K-2.2
- Define a simple problem that can be solved through the development of a new or improved object or tool. SEP.2.K-2.3

3. Constructing Explanations and Designing Solutions SEP.3

K-2. Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. SEP.3.K-2

- Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. SEP.3.K-2.1

4. Developing and Using Models SEP.4

K-2. Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions. SEP.4.K-2

- Use a model to represent relationships in the natural world. SEP.4.K-2.1

6. Obtaining, Evaluating, and Communicating Information SEP.6

K-2. Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. SEP.6.K-2

- Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. SEP.6.K-2.1
- Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. SEP.6.K-2.2

7. Planning and Carrying Out Investigations SEP.7

K-2. Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. SEP.7.K-2

- With guidance, plan and conduct an investigation in collaboration with peers. SEP.7.K-2.1
- Make observations (firsthand or from media) to collect data that can be used to make comparisons. SEP.7.K-2.2

8. Scientific Investigations Use a Variety of Methods SEP.8

- Scientists use different ways to study the world. SEP.8.1

9. Scientific Knowledge is Based on Empirical Evidence SEP.9

- Scientists look for patterns and order when making observations about the world. SEP.9.1

Disciplinary Core Ideas DCI

A. Forces and Motion DCI.PS2.A

- Pushes and pulls can have different strengths and directions. DCI.PS2.A.K-2.1
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. DCI.PS2.A.K-2.2

B. Types of Interactions DCI.PS2.B

- When objects touch or collide, they push on one another and can change motion. DCI.PS2.B.K-2.1

B. Conservation of Energy and Energy Transfer DCI.PS3.B

- Sunlight warms Earth's surface. DCI.PS3.B.K-2.1

C. Relationship Between Energy and Forces DCI.PS3.C

- A bigger push or pull makes things speed up or slow down more quickly. DCI.PS3.C.K-2.1

C. Organization for Matter and Energy Flow in Organisms DCI.LS1.C

- All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. DCI.LS1.C.K-2.1

D. Weather and Climate DCI.ESS2.D

- Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. DCI.ESS2.D.K-2.1

E. Biogeology DCI.ESS2.E

- Plants and animals can change their environment. DCI.ESS2.E.K-2.1

A. Natural Resources DCI.ESS3.A

- Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. DCI.ESS3.A.K-2.1

B. Natural Hazards DCI.ESS3.B

- Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. DCI.ESS3.B.K-2.1

C. Human Impacts on Earth Systems DCI.ESS3.C

- Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. DCI.ESS3.C.K-2.1

A. Defining and Delimiting an Engineering Problem DCI.ETS1.A

- Asking questions, making observations, and gathering information are helpful in thinking about problems. DCI.ETS1.A.K-2.1
- A situation that people want to change or create can be approached as a problem to be solved through engineering. DCI.ETS1.A.K-2.2
- Before beginning to design a solution, it is important to clearly understand the problem. DCI.ETS1.A.K-2.3

A. Defining Engineering Problems DCI.ETS1.A

- A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. DCI.ETS1.A.K-2.1

B. Developing Possible Solutions DCI.ETS1.B

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. DCI.ETS1.B.K-2.1

C. Optimizing the Design Solution DCI.ETS1.C

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. DCI.ETS1.C.K-2.1

Crosscutting Concepts CCC

1. Patterns CCC.1

- Patterns in the natural and human designed world can be observed and used as evidence. CCC.1.K-2.1
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. CCC.1.K-2.2

2. Cause and Effect CCC.2

- Simple tests can be designed to gather evidence to support or refute student ideas about causes. CCC.2.K-2.1
- Events have causes that generate observable patterns. CCC.2.K-2.2

4. Systems and System Models CCC.4

- Systems in the natural and designed world have parts that work together. CCC.4.K-2.1

6. Structure and Function CCC.6

- The shape and stability of structures of natural and designed objects are related to their function(s). CCC.6.K-2.1

8. Influence of Engineering, Technology, and Science on Society and the Natural World CCC.8

- People depend on various technologies in their lives; human life would be very different without technology. CCC.8.K-2.1

9. Interdependence of Science, Engineering, and Technology CCC.9

- People encounter questions about the natural world every day. CCC.9.K-2.1